REMARKS

Request for Reconsideration

Applicant has carefully considered the matters raised by the Examiner in the outstanding Office Action but remains of the opinion that patentable subject matter is present. Applicant respectfully requests reconsideration of the Examiner's position based on the following remarks.

Claims Status

Claims 1-7 are pending in this Application. No amendments have been made herein.

Rejection

Claims 1-4, 6 and 7 had been rejected as unpatentable over a combination of Mills and Moriyama. Claim 5 had been rejected based on the combination of Mills, Moriyama and Hintermann.

Claims 1 and 7 are independent claims in this Application. In both Claims 1 and 7, the maximum amount of ink that is applied to the recording medium is defined as a function of the recording speed. In other words, as the speed at which the recording medium, e.g. paper, passes

through the image recording apparatus, e.g. the printer, the amount of ink which is applied to the recording media, is varied.

In Claim 2, which is dependent upon Claim 1, this function is defined as inversely proportional. In other words, as the speed of the recording medium increases, the amount of ink applied to the recording medium is decreased and visa versa.

What Applicant has found is that by making the amount of ink that is applied to the recording medium a function of the speed of the recording medium through the apparatus, a higher quality image can be obtained.

This relationship of speed and the amount of ink is key for an image recording system which uses a ray curable ink. It is key for a ray curable ink because enough ultraviolet light must be applied to the ink in order to cure the ink. If the recording medium is passing through the apparatus quickly, then the amount of irradiation which is applied on a unit area of the recording medium is decreased. If the amount of radiation is decreased, then the amount of curing is also decreased. Thus, if there is

a large quantity of ink on the paper and the amount of irradiation is decreased, then the ink will not be fully cured. Applicant has found that, in order to solve this incomplete curing problem, the amount of ink should be a function of the speed of the paper passing through the recording apparatus. This aspect of the present Invention is brought out in the two full paragraphs that appear on page 46 of the Application.

This aspect of the present Invention is also brought out in the Tables which are attached to the Application. For example, in Figure 5, the resolution for Samples 1 through 5 is maintained at 720 dpi. However, a comparison should be made between Recording Conditions 1, 4 and 5. Recording Condition 1 is a base Recording Condition from which Samples 4 and 5 can be compared. In Recording Conditions 4 and 5, the speed of the recording medium through the apparatus has been doubled, i.e. Recording Condition 1 is 8 passes while Recording Conditions 4 and 5 are 4 passes, thus Recording Conditions 4 and 5 passes the recording medium through the printer twice as fast as Recording Condition 1. In Recording Condition 4, however, the amount of ink applied per unit area of paper is the same as Recording Condition 1, the maximum amount of ink

adhered in both Recording Conditions 1 and 4 is 23.6 ml/m^2. It can be seen by comparing conditions 1 to 4 that, although the same resolution is maintained and that the same amount of ink is applied per unit area, the quality of the recording is decreased. Ink blurring drops from A to B, adhesion drops from A to C, and wrinkle drops from A to C. Thus, when comparing Recording Conditions 1 to 4, it can be seen that by doubling the recording speed while maintaining the same amount of ink, causes a decrease in the quality of the recording medium.

Recording Conditions 1 and 4 should be contrasted against Recording Condition 5. In Recording Condition 5, the amount of ink is decreased by about half, i.e. 14.8 ml/m^2. As shown in Recording Condition 5, the amount of ink is decreased yet the quality (blurring, adhesion, wrinkle) is maintained to be approximately that of recording condition 1. Thus, by comparing conditions 1, 4 and 5, it can be seen that by making the amount of ink a function of the speed that the recorded image can be maintained. Specifically, it is seen that by making the amount of ink inversely proportional to the speed, a high quality image is obtained.

The same holds true by comparing Recording Conditions 6, 7 and 8. In Recording Conditions 6, 7 and 8, the same resolution is maintained but the recording speed and the amount of ink is varied. Specifically, Recording Conditions 7 and 8 double the speed of the recording done under Recording Condition 6. In Recording Condition 7, although the speed is doubled, the amount of ink that is applied is maintained the same, 22.4 ml/m^2. It can also be seen that, although the speed has been doubled, the image quality has been substantially reduced by going from A to C in all cases.

In contrast, under Recording Condition 8, the amount of ink has been decreased by about one quarter compared to conditions 6 and 7. By decreasing the amount of ink, it can be seen that the recorded conditions are essentially maintained, i.e. 6 and 8 are similar. Thus, it can be seen by comparing conditions 6, 7 and 8, although the resolution (dpi) is maintained, by making the amount of ink applied a function of the recording speed, an improvement in the overall recording is obtained.

Turning now to the art, Applicant makes a three fold argument. First, Applicant respectfully disagrees with the fact that Moriyama is combined with Mills. Second, even if Moriyama is combined with Mills, it doesn't result in the present Invention. Third, if Moriyama is considered to teach ink is varied with speed, then it teaches away from the present Invention.

It is improper to combine Moriyama with Mills because Moriyama is directed to a conventional ink jet recording apparatus which uses a water based ink. Using a water based ink, it is substantially different than using an ultra violet curable ink because an ultraviolet curable ink requires that the ink be subject to an ultraviolet ray so as to cure the ink. As noted above, what Applicant has discovered, is the need to decrease the amount of ink in order to allow the ultraviolet ray to properly cure the ink where the speed of the recording media is increased through the recording apparatus. Decreasing the amount of ink allowed for the ultraviolet rays to properly cure the ink. This curing problem is not faced by Moriyama since Moriyama does not have to cure his ink. Thus, it is respectfully submitted that it is improper for the Examiner to combine the teachings of Moriyama with the teachings of Mills

because the present Invention is directed to ray curable inks and solves the problem which is specific to using a ray curable ink.

However, even if Moriyama is combined with Mills, the combination does not teach that the amount of ink is a function of the recording speed.

Moriyama teaches that, at Column 6, lines 26-55, the amount of ink is a function of the resolution (dpi). Resolution is measured in dpi, not the speed of the recording medium through printer.

In fact, as shown by Applicant's Examples in Figure 5, the same resolution, dpi, can be maintained while accelerating or decelerating the recording medium through the printer. Thus, as noted above, for Recording Conditions 4 and 5, the speed of the recording mediums is increased compared to Recording Condition 1, yet the dpi, resolution, is maintained at 720. Thus, it is respectfully submitted that Moriyama does not teach that the amount of ink applied to the recording medium is a function of the speed at which the recording paper passes through the

recording apparatus. Rather, Moriyama is teaching that the amount of ink is varied depending on the resolution, dpi.

Furthermore, it is submitted that Moriyama teaches away from the present Invention.

Moriyama says that in a fast recording mode, the recording is performed at a resolution of 360 dpi. He goes on to say that, on the other hand, in a high quality recording mode, the recording is performed as a resolution of 720 dpi and the discharge volume is decreased, see Column 16, lines 26-33. It appears that at slower speeds, 720 dpi, Moriyama is suggesting less ink. This is in direct contrast to the present Invention as recited in Claim 2 which teaches the function is inversely proportional, increase speed, decrease ink. Thus, it is submitted that Moriyama teaches away from the present Invention.

Turning to the other two cited references, Mills and Hintermann, neither one of these references teach that the amount of ink is a function of the speed which the recording medium passes through the recording apparatus.

Thus, it is submitted that, even if the references were combined, such would not result in the present Invention.

In view of the foregoing, it is respectfully submitted that the claims, as presented herein, are patentable over the cited references taken alone or in combination.

A timely Response is due on May 14, 2006. As May 14, 2006 fell on a Sunday, Applicant is filing this Response on Monday, May 15, 2006 and it is timely.

Conclusion

In view of the foregoing, it is respectfully submitted that the Application is in condition for allowance and such action is respectfully requested. Should any fees or extensions of time be necessary in order to maintain this Application in pending condition, appropriate requests are

hereby made and authorization is given to debit Account # 02-2275.

Respectfully submitted,

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